

REMARKS

The Final Office Action mailed December 31, 2002, has been received and reviewed. Claims 7, 8, 15, 16, 25 through 28, 30, 31, 38 through 44, 46 through 50, and 57 through 61 are currently pending in the application. Claims 15, 16 and 57 through 61 stand rejected. Claims 7, 8, 25 through 28, 30, 31, 38 through 44, and 46 through 50 are allowed. Applicants propose to amend claims 15 and 57, and respectfully request reconsideration of the application as proposed to be amended herein.

35 U.S.C. § 112 Claim Rejections

Claims 15, 16 and 57 through 61 stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicants respectfully traverse this rejection, as hereinafter set forth.

The claim 15 and 57 limitations of at least one conductive bump having a height to width ratio of at least approximately 3 to 1 concurrent with a generally planar surface are supported by the original disclosure. The original disclosure describes the present invention with an example of forming adhesive prints 102 on a semiconductor substrate 104 (specification, pages 12-13 and Figs. 1-5). Referring to Fig. 3, the description of the example expressly provides "... the adhesive prints 102 are ideally formed with vertical side walls 122 and a planar upper surface 124." (specification, page 12, lines 20-22). The assembly is then inverted to contain the flow and expansion of adhesive prints 102 during drying or curing, providing increased wall angles and top surface area (specification, page 13, lines 7-13). The original disclosure goes on to describe adhesive embodiments 202, 302, 402, 502 for other semiconductor device structures, which are formed using the present invention to similarly contain flow and expansion (specification, pages 15-16 and Figs. 15-22). Specifically, the example for forming conductive bumps 502 describes maintaining the definition of bumps 1002 formed with a print screen or stencil by inverting them, as with adhesive prints 102 (specification, pages 9 and 16 and Figs. 22 and 41-43). Maintaining the definition allows formation of conductive bumps 502, achieving "height to width ratios of the

preferred target of 3:1 or greater" (specification, page 16, lines 23-27). Therefore, Applicants maintain their position that the original disclosure contains sufficient description to support the limitations in claims 15 and 57 of "at least one laterally unconstrained conductive bump comprised of a viscous adhesive material ... exhibiting a height-to-width ratio of at least approximately 3 to 1 and including ... a second exposed surface ... exhibiting a generally planar portion over a substantial portion thereof."

While maintaining the position that the original disclosure supports the presently claimed invention, in an effort to resolve the issue, Applicants propose to amend claims 15 and 57 as suggested by the Examiner. Specifically, Applicants propose to remove the limitations in claims 15 and 57 that recite the second surface of the conductive bump exhibits a "generally planar" portion or configuration. Applicants respectfully submit that these proposed amendments put claims 15, 16 and 57 through 61, and request the case be passed to issue.

Drawings

Applicants submit herewith, under cover of a separate Letter to the Official Draftsperson, proposed corrections to FIGS. 7, 10, 13 and 23-43 of the drawings. Specifically, FIGS. 7, 10, 13 and 23-43 have been revised to add "**PRIOR ART.**" All proposed corrections have been marked in red. Applicants respectfully request approval of the corrections to the drawings. Also enclosed is a Transmittal of Formal Drawings with formal drawings revised as proposed.

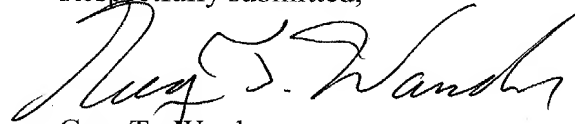
ENTRY OF AMENDMENTS

The proposed amendments to claims 15 and 57 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application. If the Examiner determines that the amendments do not place the application in condition for allowance, entry is respectfully requested upon filing of a Notice of Appeal herein.

CONCLUSION

Claims 7, 8, 15, 16, 25 through 28, 30, 31, 38 through 44, 46 through 50, and 57 through 61 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,



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GTW/dlm:ljb

Enclosure: Version With Markings to Show Changes Made

Document in ProLaw

VERSION WITH MARKINGS TO SHOW CHANGES MADE

15. (Amended four times) A flip-chip including at least one laterally unconstrained conductive bump comprised of a viscous conductive material, the at least one conductive bump exhibiting a height-to-width ratio of at least approximately 3 to 1 and including a first surface adjacent and supported from beneath by said flip-chip and a second exposed surface opposite said first surface [exhibiting a generally planar portion over a substantial portion thereof], said flip chip including said at least one conductive bump formed by:
providing said flip-chip with at least one bond pad;
dispensing a viscous conductive material on said flip-chip to define at least one conductive bump of a selected configuration exhibiting a height-to-width ratio of at least approximately 3 to 1, said at least one conductive bump in electrical communication with said at least one bond pad of said flip-chip and including a first surface adjacent said flip-chip and a second surface opposite said first surface; and
inverting said flip-chip without substantial lateral confinement of said viscous conductive material and maintaining said flip-chip in an inverted position at least until said conductive material substantially stabilizes so as to exhibit a desired stable shape and lateral boundary substantially defining sizes of said first and second surfaces of said at least one conductive bump [and wherein a substantial portion of said second surface of said at least one conductive bump exhibits a generally planar configuration].

57. (Twice amended) A flip-chip including at least one laterally unconstrained conductive bump comprised of a viscous conductive material, the at least one conductive bump exhibiting a height-to-width ratio of at least approximately 3 to 1 and including a first surface adjacent and supported from beneath by said flip-chip and a second exposed surface opposite said first surface[, said second exposed surface exhibiting a generally planar portion over a substantial portion thereof].